

IoT is a Powerful Path to Product Performance

Learn the Truth About Your Products

Abstract

This white paper makes the case for IoT as a powerful tool to understand product performance.

The Internet of Things is having a massive impact on all kinds of companies in all kinds of industries, generating headlines about large-scale, industrial-strength applications of this powerful technology framework. But IoT—sensors, the infrastructure to capture sensor data, and the Big Data analytics required to put it to work—is finding more and more applications in consumer products.

This white paper makes the case for IoT as a powerful tool to understand product performance. More important, it outlines key factors for success in using IoT-generated performance data to make better products and forge deeper, more beneficial, and more profitable relationships with your customers.

Should There Be an IoT Sensor in Your Coffee Maker?

IoT is not solely for the GEs of the world, and not solely for use in enormous engines, turbines, and industrial machinery.

The Internet of Things (IoT) is creating massive new businesses and remarkable new business models. Gartner predicts the number of “connected things” worldwide will reach nearly 21 billion by 2020 (and Gartner is at the low end of many predictions).¹ Companies are pouring money into IoT research. General Electric has made a “bet the company” investment in IoT, predicting that investment in industrial applications of IoT (often referred to as IIoT, Industrial Internet of Things) will top \$60 trillion during the next 15 years.² And sensors and IoT are finding application in everything from transportation and logistics to industrial asset management and manufacturing.

Industry analysts and technology trend watchers tend to focus on these large-scale, high-profile applications of IoT—and without doubt, IoT will change the face of many industries. But IoT is not solely for the GEs of the world, and not solely for use in enormous engines, turbines, and industrial machinery. Sensor data and the Internet of Things also represent an unprecedented new way to understand how products, even relatively low-cost ones, are performing for customers. IoT technologies can even generate new businesses and revenue streams for companies willing to embed digital sensors in their products—and able to convince consumers there is value in doing so.



Sensors are increasingly common in all kinds of consumer products, including smartphones, wearables, appliances, smart home thermostats, and more.

Sensor Data Provides the Ultimate Truth

Sales figures are a very good measure of the market's receptivity to what you're offering. If sales are on the rise, you're doing something right. But every good company wants to know more. You log customer feedback through the call center. You survey customers and get their impressions of your product, service, or value. You may even be monitoring social media channels (and if you aren't, you should be) to get an unfiltered, uncensored view of your customers' perspectives on whatever it is you're selling. This is all good information, and it's all useful. But it's not enough.

Here's an example from personal experience. A friend of mine bought an expensive, high-quality coffee machine for his home, one that uses ready-to-use pods to make perfect espresso and other coffee drinks. For two years, the machine worked without a hitch—and then it didn't. My friend's wife called the manufacturer, who walked her through a troubleshooting routine. That didn't work. Then the manufacturer offered to mail them a diagnostic tool in the next seven to 10 days to troubleshoot the unusable machine further.

But that just wasn't good enough—and it wasn't nearly quick enough. No one I know is going to make do with instant coffee or fetch Starbucks every morning for seven to 10 days while nurturing the hope of a fix. To most of us, a working coffee machine is as essential as hot water in the shower, and we aren't willing to wait. (My friends, like most of us would, are in that camp; they bought a new machine—one from a different manufacturer.)

The manufacturer didn't just lose a customer; it lost what was probably a years-long recurring revenue stream in the form of disposable pods. The situation could have been avoided using a simple digital sensor capable of periodically pinging data back to the manufacturer on machine performance. That data could have predicted the failure well before it happened, prompting the manufacturer to send the diagnostic tool preemptively, greatly increasing the probability of retaining a customer and a revenue stream.

Sensor data can be the ultimate truth about product performance. First, it's an objective source of how a product is being used and how well it works over time. That's valuable input for the next generation of products. But it's also valuable because it enables you to take action before a customer defects. By the time you've received the business equivalent of the "Dear John" letter—"I'm cancelling my account"; "I'm

The manufacturer didn't just lose a customer; it lost what was probably a years-long recurring revenue stream in the form of disposable pods. The situation could have been avoided using a simple digital sensor capable of periodically pinging data back to the manufacturer on machine performance.

That is the real challenge of IoT for any kind of company and product: using sensor data to get to the real, useful truth about your products and your customers and take action.

returning this defective product”; “I’ll never buy from your company again”—it’s way too late to salvage the relationship.

And it’s worth pointing out that sensors are cheap and getting cheaper. According to data gathered by GE from Goldman Sachs and BI Intelligence, the average cost of an IoT sensor has declined steadily. In 2004, the average sensor cost about \$1.30; in 2016, it was down to \$0.50. By 2020, the trend line suggests that a sensor will cost \$0.38.³

The average cost of IoT sensors is falling



There are other costs, of course: design and installation of the sensors plus the technology infrastructure to collect the data and put it to work. That is the real challenge of IoT for any kind of company and product: using sensor data to get to the real, useful truth about your products and your customers and take action.

Four Mandates for Sensor Success

We’ve discovered four key requirements for using IoT data effectively:

Factor #1: Getting customers to agree to have sensors monitoring their products and their use.

To some a connected appliance may feel intrusive; to some it feels dangerous (hacking etc.). So if you want customers to accept your sensor-equipped products, you have to make it worth their while.

Take the example of HP Inc., the Hewlett-Packard spinoff that makes all kinds of digital devices, including printers. Back in 2013, HP began to outfit printers with wireless sensors that monitor ink levels and automatically trigger reorders before customers run out of ink. This alone is a real convenience to users, but HP also offered significant discounts (of up to 50%) for customers willing to participate. The results have been fantastic: HP CIO Naresh Shanker told us that giving customer value was essential to the success of the program.

IoT technology may face the greatest organizational resistance of all the technologies companies have implemented over the last 50 years.

Factor #2: Processing data and taking action fast.

Let's go back to the example of the high-end coffee maker my friend purchased. And let's say it had been equipped with a sensor that could detect a problem. The manufacturer would need a robust system to process large volumes of digital sensor data (a constant stream of sensor data from thousands or hundreds of thousands or millions of products), identify machines with problems, and then trigger, in something close to real time, an appropriate response. That could be an outbound call or email to the customer from support, signaling a potential problem and suggesting a fix. Another output might be an automated trigger for an enterprise resource planning system to send a part to the customer and, unless under warranty, a bill. Or for higher value machines, automatically sending a repair professional (or even a replacement machine).

In other words, the manufacturer's IoT system must be seamlessly integrated with ERP system for billing, distribution, repair, and any other activities required to make the product right. This actually expands and redefines the notion of "product": the physical object plus the entire set of systems and capabilities that stand behind the product plus the experience of owning and using the products and the services that surround it. A good IoT program for a consumer product deepens and extends the relationship with the consumer.

Factor #3: Accepting the truth—however bad.

Here's a bold statement that we believe is undeniably true: IoT technology may face the greatest organizational resistance of all the technologies companies have implemented over the last 50 years.

Think about it this way: Good IoT data provides a daily (or more frequent) log of problems, issues, and customer troubles. What product manager, production head, or R&D executive really wants the CEO to know exactly how many products they've developed are having issues in the field?

According to Jonathan Ballon, vice president and general manager of Intel's multibillion dollar IoT business, this is a huge issue. "Without question, the biggest barrier to the internet of things is cultural," he said. "It's organizational inertia that gets in the way. People are afraid of what new technologies might reveal about the business."

That's why it's imperative that the drive to use IoT must come from the top and be supported by senior management. "The companies I find that are brave are driving this change from the top," said Ballon. "The more timid and change-averse companies tend to dig in with their feet, get lost in the weeds, and take too long to make technology decisions."

Factor #4: “Reimagine the business” should be your mantra.

Here’s the biggest lesson for would-be IoT adopters: Don’t simply try to improve current operations. Rethink and reimagine how you do business and even what kind of business you do.

Sensors for monitoring performance are not new. But for decades they were used for expensive, critical products—elevators are a prime example—where preventing failure isn’t just nice to have, it’s essential. In today’s world, IoT technology has changed the playing field dramatically by giving you the opportunity to monitor product performance at virtually any price point. IoT can improve performance and customer loyalty in all kinds of products.

I mentioned HP sensor-equipped printers already. But other examples abound: Procter & Gamble has sold an electronic toothbrush with wireless sensor for years. Nest thermostats, smoke and CO2 detectors, and home security systems depend on sensors and a host of technologies. A variety of smart scales on the market transmit your weight to your phone and to a website. Wearables use wireless sensors to capture data for your use—data that could, one day, be leveraged by health care providers and health insurance companies. Some consumer products don’t even need special dedicated sensors. For example, some auto insurers are leveraging data from smartphones (which are sensor-laden) to offer usage-based pricing.

IoT will continue to have an enormous impact in industrial, manufacturing, and large-scale process control applications. But IoT can add tremendous value to all kinds of companies, all kinds of products, and all kind of consumers who use them—if you’re open to reimagining the way you do business.

Look at your business through the lens of these four factors and you will start to see the possibilities of the Internet of Things. You’ll learn some truths—perhaps unvarnished!—about your products and your customers’ perceptions, but you’ll also learn how to improve product performance, increase customer satisfaction, and grow your business for the long haul.

References

[1] Gartner: <http://www.gartner.com/newsroom/id/3165317>

[2] “Roundup of Internet of Things Forecasts and Market Estimates, 2016,” by Louis Columbus, November 27, 2016; <http://www.forbes.com/sites/louiscolombus/2016/11/27/round-up-of-internet-of-things-forecasts-and-market-estimates-2016/#1b0e7d454ba5>

[3] <https://www.theatlas.com/charts/BJsmCFAI>

About The Author

Dr. Satya Ramaswamy
Head of the Digital Enterprise Unit

As head of the Digital Enterprise Unit at TCS, Dr. Satya helps customers undertake Digital Reimagination™ projects: leveraging the Digital Five Forces (mobility, Big Data, social media, cloud computing, and artificial intelligence) to create new business models, business processes, products and services, customer segments, channels, and workplaces.

Dr. Satya has more than two decades of experience with digital technologies; before he joined TCS, he led two successful startup companies in the mobile application and Big Data spaces. Dr. Satya is the holder of 10 US patents. He has a Ph.D. in Distributed Computing from the Indian Institute of Technology (Chennai) and an MBA in Marketing and Analytical Consulting from the Kellogg School of Management (Chicago). He manages the Digital Enterprise Unit from the TCS office in Santa Clara, California.

About the TCS Digital Enterprise Unit

TCS adapts the capabilities of the digital five forces—Mobility and Pervasive Computing, Big Data and Analytics, Social Media, Cloud, and Artificial Intelligence and Robotics—to the unique needs and opportunities of each industry. We leverage a combination of these technologies to help clients digitally reimagine their business models, products and services, customer segments, channels, business processes, and workplaces to gain sustained competitive advantage.

Our experienced global team includes strategy experts, business analysts, digital marketers, user experience designers, data scientists, and engineers trained and certified in the latest technologies. By combining our technology vendor partnerships, our pre-built customizable products and reusable assets, and our deep industry expertise, we offer enterprises everything they need for a complete digital transformation—from strategy and use cases to system implementation and maintenance—and everything in between.

Contact

For more information about the TCS Digital Enterprise Unit, contact digital.enterprise@tcs.com

About Tata Consultancy Services Ltd (TCS)

Tata Consultancy Services is an IT services, consulting, and business solutions organization that delivers real results to global business, ensuring a level of certainty no other firm can match. TCS offers a consulting-led, integrated portfolio of IT and IT-enabled infrastructure, engineering, and assurance services. This is delivered through its unique Global Network Delivery Model™, recognized as the benchmark of excellence in software development. A part of the Tata Group, India's largest industrial conglomerate, TCS has a global footprint and is listed on the National Stock Exchange and Bombay Stock Exchange in India.

For more information, visit us at www.tcs.com